

## ABSTRACT

This invention relates to a method and system for the radio location of CDMA and non-CDMA enabled transmitters within a reception zone. The invention exploits the superposition of antenna patterns that create complex and asymmetrical interference structures at very small scales. By randomly distributing a random antenna array of  $M$  elements across a two or three-dimensional surface, fine scale interference structures on the scale of  $\frac{1}{4}$  the carrier wavelength are generated. Once the minimum number of antennas are placed, additional antennas will not improve the resolution. Such interference structures when sampled at  $\frac{1}{8}$  the carrier wavelength or greater yields unique spatial patterns with respect to a given antenna array geometry and transmitter location. The invention incorporates signature recognition (matching) and orthogonal sub-space projection estimators to derive location estimates of a radio transmitter.